

SUBJECT INDEX

- Acanthocytosis 211
- Actin, red cell membranes 172, 177
- Activated oxygen, production by leucocytes 452
- Acute intermittent porphyria
 - diet and nutrition 63
 - epidemiology 39-48
 - haem arginate treatment 63
 - haematin treatment 64
 - hypertension in 47
 - isolation of mutant enzyme 128
 - LHRH analogue treatment 65
 - model for 53
 - ³¹P MRS 56
 - porphobilinogen deaminase in erythrocytes 32, 33
 - restriction fragment length polymorphism 127, 128, 130
- Adenosine triphosphate, phospholipid asymmetry in red cell membranes 167
- S-Adenosyl-L-methionine, effect on erythropoietic protoporphyria 89
- Adenovirus type 2 *Ela* gene 273
- Adhesion proteins 441
- Adrenaline, bronchoconstriction 370
- Adrenergic regulation of airways 368
- α -Adrenoceptors
 - airways 378
 - role in effect of haem biosynthetic intermediates 53
- β -Adrenoceptors
 - airways 373
 - function in asthma 376
- Afferent nerves, airways 356
- Airway disease 351-423
 - adrenergic mechanisms 368
 - afferent nerves 356
 - autonomic abnormalities 355
 - axon reflexes 389
 - cholinergic mechanisms 359
 - neuropeptides 382
 - non-adrenergic mechanisms 381
 - non-cholinergic mechanisms 386
- Alagille syndrome 77
- Albumin, binding in hepatocytes 30
- Alcoholism, effect on haem metabolism 29
- Alcohol and porphyria 118
- Alcohols, induction of cytochrome P-450 121
- Allylisopropylacetamide, effect on hepatic porphyrin metabolism 12
- Alveolar macrophages 437
 - role in asthma 480
 - role in fibrotic disease 467
 - role in sarcoidosis 473
- Alveoli 428
- Alveolitis 465
- 5-Aminolevulinic acid
 - ¹³C NMR 143
 - pharmacological effects 50
 - porphyrin biosynthesis form in breast carcinoma 105
 - effect of prazosin on activity of 53
 - effect on rat jejunum 53, 55
 - synthesis in *Cyanidium caldarium*, gabaculine inhibition 133
 - synthesis in *E. coli* 135
 - synthesis in plants 134
 - effect on ventral root activity in spinal cord 53
- Aminolevulinic acid dehydratase
 - effect of alcoholism 29
 - in diabetic mice 28, 29
 - in erythroleukemia cells, effect of dimethyl sulphoxide 97
 - lead and metal ion chelators are slow binding inhibitors 27
 - in *Mucor rouxii* 28
 - porphyria 22
 - in *Rhizobium japonicum* 135
 - effect of valproic acid 117
- Aminolevulinic acid synthase
 - in chicken embryo 141
 - cDNA clones 128
 - control of synthesis 117, 120, 121
 - in haem deficient erythroblasts 98
 - in hepatoma cells 140
 - induction by synthetic oestrogens 121
 - in *Mucor rouxii* 28
 - porphyria 21
- Amphiboles 328, 332, 333
- Anion transporter protein 177
- Ankyrin 173, 176, 181
 - spectrin interaction 195
 - spherocytosis 206
- Arsenic, effect on coproporphyrinogen oxidation in liver and kidney 25
- Asbestos 325-345
 - chemistry and composition 327
 - epidemiology of related disease 333
 - fibre respirability and retention 331
 - mechanisms of pathogenesis 335, 465
- Asthma
 - α -adrenoceptor function 379
 - β -adrenoceptor function 376
 - autonomic abnormalities 355
 - axon reflexes 389
 - effect of beta-blockers 371
 - catecholamines 371
 - cholinergic mechanisms 365
 - role of leucocytes 475
- Athymic mice, tissue porphyrins 150
- Autonomic regulation of airways 353
- Axon reflexes, asthma 389
- Azurophil granules 436

- Basic protein, leucocytes 454
 role in asthma 477
 Basophils 438
 role in asthma 478
 Beta-blockers, airway function 371
 Bilirubin metabolism 153-160
 genetic defects 153
 role of lipid peroxidation 155
 Bilirubin-IX, synthesis 159
 Bilirubin oxidase, in liver microsomes 158
 Biliverdin reductase 158
 Bleomycin, lung injury 465, 467
 Bone marrow, cells derived from 432
 Breast cancer, porphyrin biosynthesis 105
 Bronchoconstriction
 adrenergic mechanisms 368
 afferent nerves 357
 cholinergic mechanisms 359
 Buserelin 66
- Calcitonin gene-related peptide, in
 airways 389
 Calmodulin, regulation of red cell membrane
 protein interactions 174
 Cancer
 lung, mineral fibre induced 334, 339, 341
 porphyrins, photochemotherapy 99-111
 Carbon monoxide, haem oxygenase
 measurement 35
 Catecholamines, asthma 371
 Ceramic fibres 331
 C-fibres, airways 358
 Charcoal, effect on cutaneous
 photosensitivity 62
 Chelation therapy, porphyria 65
 Chemotaxis, leucocytes 448
 Chester porphyria 46
 Chicken embryo, 5-aminolevulinic acid synthase
 production 141
 Chlorophyll, destruction in stressed plants,
 role of iron 132
 Chloroquine, porphyria treatment 73, 74
 Cholecystokinin octapeptide, in airways 392
 Cholesterol, red cell membrane 165
 Cholinergic mechanisms in airways 359
 Chromosomes, mineral fibre induced
 aberrations 339
 Chronic obstructive airways disease 357, 367
 Chrysotile 327, 332, 333, 335, 339
 Cigarette smoke
 asbestos interaction 341
 emphysema 462
 irritant receptors 357
 Clara cells, stimulation by beta-agonists 373
 Cobalt-protoporphyrin 24
 Collagenases, in leucocytes 454
 Collagens, lung 430
 Colony stimulating factors 434
 Committee on Review of
 Porphyrinogenicity 113
 Congenital dyserythropoietic anaemias 213
 Congenital erythropoietic porphyria 86, 87
- Coproporphyrin 11
 trace metal-induced 25
 Coproporphyrin
 abnormalities in Alagille syndrome 77
 photosensitization by 109
 secretion after chloroquine treatment 74
 Coproporphyrinogen oxidase, in liver 25
 Cough receptors 357
 Crigler-Najjar syndromes 153, 155, 156
 Crocidolite 334
 Cryptogenic fibrosing alveolitis 465
 Cyanidium caldarium
 gabaculine inhibition of 5-aminolevulinic
 acid synthase 133
 haem oxygenase in 133, 159
 Cyclophosphamide, porphyrinogenic
 action 122
 Cystic fibrosis, autonomic abnormalities 356
 Cytoadhesins 445
 Cytochrome P-450
 control of hepatic 5-aminolevulinic acid
 synthase 117, 120, 121
 induction by alcohols 121
 Cytochrome P-450d, role in uroporphyrinogen
 oxidation 115
 Cytogenetics 258
 Cytokines, leucocytes 456
 Czechoslovakia, hepatic porphyrias in 42
- Deoxyribonucleic acid, effect of asbestos 339
 Deoxyribonucleic acid, transfection and
 metastasis
 Ela 273
 genomic DNA 271
 MHC genes 272
 oncogenes 259
 Desferrioxamine, porphyria cutanea tarda 72
 Diabetes, haem biosynthesis 28, 29
 Diapedesis, leucocytes 448
 Diet, porphyria 63
 Differential cDNA screening, metastasis 275
 Dihydropyridines, porphyrinogenicity 116
 2,3-Dimercaptopropane-1-sulphonate, lead
 poisoning therapy 27
 Dimethyl sulphoxide
 induction of 5-aminolevulinic acid synthase
 in hepatoma cells 140
 effect on mRNA and 5-aminolevulinic
 acid dehydratase in erythroleukemia
 cells 97
 Diprivan, porphyrinogenesis 119
- Ela*, metastasis 273
 EDTA
 porphobilinogen synthase inhibition 27
 porphyria therapy 65
 Elastases, leucocytes 453
 emphysema 462
 Elastin, lung 430
 Elastin adhesion proteins 447

- ELISA, porphobilinogen deaminase in erythrocytes 32
- Elliptycrosis 185
- epidemiology 200
- malaria 201
- protein 4.1 197, 199
- sialoglycoproteins 198
- spectrin abnormality 188
- Emphysema, role of leucocytes 460
- Endothelial leucocyte adhesion molecule-1 446
- Eosinophils 436
- basic proteins 454
- role in asthma 475
- role in fibrotic lung disease 471
- Erionite 328, 334, 340
- Erythrohepatic protoporphyria 90
- Erythropoietic haem synthesis 91-98
- Erythropoietic porphyrias 83-90
- S-adenosyl-L-methionine 89
- congenital 86, 87
- haematin in 86
- haem synthetase deficiency 85
- inactivation of spleen deaminase by porphyrin 87
- protoporphyrin 88
- Erythropoietic protoporphyria 11
- bile porphyrin and porphyrinogen levels 54
- Erythropoietin, treatment for porphyria cutanea tarda 73
- Escherichia coli*
- 5-aminolevulinic acid synthesis in 135
- porphobilinogen deaminase in 142
- Ferric nitrilotriacetate 72
- Ferritin, in serum in porphyria cutanea tarda 80
- Fibronectin, lung 430
- Fibrosis, mineral fibre induced 333, 335
- Fibrotic lung disease 465
- role of macrophages 467
- Finland, porphyria in 44
- fos-oncogene 269
- Franklin fibre 338
- Fybex 331
- Gabaculine, inhibition of 5-aminolevulinic acid synthesis in *Cyanidium caldarium* 133
- Galanin, airways 391
- Gamma interferon 457
- Ganglia, airways 364
- Gastrin-releasing peptide, airways 392
- Gelatinase, in neutrophils 454
- Gene amplification 254
- Genetic instability, tumours 252
- Genomic DNA 271
- Gerbich negative individuals 199
- β -Globulin gene 126
- Glucose, effect on haem metabolism 28
- Glycine, incorporation into porphyrin ring 13
- Glycosphingolipids, in red cell membrane 165
- Goldberg, A. 3
- Granule membrane protein-140 446
- Granulocyte colony stimulating factor 434
- Granulocyte-macrophage colony stimulating factor 434
- Griseofulvin, induced protoporphyria 123
- Growth factors, in leucocytes 456
- Gunther's disease 87
- Haem
- alcoholism and metabolism of 29
- biosynthesis 21, 125-130, 137-144
- cell culture synthesis 137-144
- deficiency 50
- erythropoietic synthesis 91-98
- metabolism in diabetic mice 28, 29
- metabolism in liver 12
- molecular biology 125-130
- regulation of gene expression 23
- effect of valproic acid on synthesis 117
- Haem arginate 60, 61, 63
- Haematin
- effect on erythropoietic porphyria 86
- porphyria treatment 64
- Haematoporphyrin derivative 99, 104, 106, 108, 109
- Haemin, effect of prazosin on pharmacological activity 53
- Haemodialysis, porphyria cutanea tarda 73, 77
- Haemoglobinopathies 215
- Haemopexin 23
- binding in hepatocytes 30
- Haem oxygenase 23
- in *Cyanidium caldarium* 133, 159
- measured by CO production 35
- regulation by metalloporphyrins 24
- sensitivity to synthetic metalloporphyrins 160
- Haem precursors, inhibition of porphobilinogen deaminases 51
- Haem synthetase, genetics of deficiency in erythropoietic protoporphyria 85
- protoporphyrin 85
- Hardarian gland, role in porphyrin synthesis 145-152
- Hepatocytes, porphyrin synthesis 139
- Hepatoma cells
- 5-aminolevulinic acid synthase in 140
- porphyrin synthesis in 139
- Hering-Breuer reflex 357
- Hexachlorobenzene
- induced Turkish porphyria 11, 13
- overload 78
- transplacental and mammary absorption 81
- Histamine
- asthma 479
- irritant receptors 357
- leucocytes 455
- HLA types, porphyria cutanea tarda 76

- HPLC, plasma porphyrins 33, 35
H-ras-gene, metastasis 260, 264
Hypertension, acute intermittent porphyria 47
- Inflammation
 asthma 475
 integrins 444
 interleukins 457
 lung, role of leucocytes 444, 451
Insulin-like growth factor-1 458
Interferons 457
Integrins 441
Interleukin-1 456
Interleukin-2 457
Interleukin-3 434
Interleukin-5 434
Interleukin-8 457
Interstitial lung disease, role of leucocytes 464
Intracellular adhesion molecule-1 443, 446
Iron
 genetic expression of haem metabolism 96
 porphyria cutanea tarda 67, 72, 74, 76, 77, 82
 role in chlorophyll destruction in stressed plants 132
 uroporphyrin 122
 utilization in beta-thalassaemia 94
Iron deficiency anaemia, zinc protoporphyrin formation 26
Irritant receptors 357
- Kevlar 331
Kidney, trace-metal induced coproporphyrin 25
- Laminin, lung 430
Leach phenotype 199
Lead
 porphobilinogen synthase inhibition 27
 effect on protoporphyrin IX 31
Lead poisoning, therapy
 with 2,3-dimercaptopropane-1-sulphonate 27
Leucocytes 425-526
 chemotaxis and diapedesis 448
 integrins 443
 mechanisms of adherence 441
 origin of cells 432
 products of 452
 role in pulmonary disease 460
LHRH analogues, porphyria treatment 65, 66
Lipid peroxidation, role in bilirubin metabolism 155
Liver, role in erythropoietic protoporphyrin 85
Low density lipoproteins, role in porphyrin uptake 101
- Lung
 α -adrenoceptors 378
 β -adrenoceptors 373
 architecture 428
 leucocytes and disease 460
 mechanisms of adherence 441
 mineral fibre related disease 333, 335
 mineral fibre retention 331
Lymphocyte-associated molecule-1 446
Lymphocyte homing receptor 446
Lymphocytes 439
 cell adhesion receptors 446
 role in asthma 479
 role in fibrotic lung disease 470
 role in sarcoidosis 471
Lymphoid cells 435
- Macrophage colony stimulating factor 434
Macrophages 437
 collagenases in 454
 emphysema 464
 role in asthma 480
 role in fibrotic lung disease 335, 467
 role in sarcoidosis 473
Magnetic Resonance Spectroscopy, ^{31}P , porphyria 56
Major histocompatibility complex genes 272
Malaria, elliptocytosis 201
Man-made mineral fibres 331, 335
Mast cells 434, 438
 role in asthma 478
McLeod phenotype 212
Menstrual cycle
 porphobilinogen deaminase in red blood cells 52
 porphyria 59, 66
Mercury, effect on coproporphyrinogen oxidation in liver and kidney 25
Mesothelioma, asbestos induced 333, 337
Metalloporphyrins
 control of haem metabolism 24
 GCMS 19
 haem oxygenase inhibition 35, 160
Metalloporphyrin 107
Metastasis 243-324
 assays for 245
 cytogenetics 258
 differential cDNA screening 275
 DNA transfection 259
 genetic instability 252
 genetic models 254
 genomic DNA 271
 methylation 282
 oncogenes 259
 RNA expression 275
 somatic cell hybridization 256
 tumour heterogeneity 247
Metastogens 256
Methylation, metastasis 282
Mineral fibres, pathogenic mechanisms 325-349
Monocytes 437

- Mononuclear leucocytes 432
Mucor rouxii, 5-aminolevulinic acid synthetase and 5-aminolevulinic acid dehydratase in 28
 Mucus secretion, airways 361
 Muscarinic receptors, airways 362
 Mutation, metastatic variants 253
 Myeloid cells 432
 Myosin, red cell membranes 173
- NADPH oxidase, induction 132
 Nedocromil sodium 358
 Neuroendocrine cells, airways 359
 Neurokinin A, effect on airways 387
 Neuropeptide Y, in airways 391
 Neutral endopeptidase, in airways 388
 Neutrophil-activating peptide-1 457
 Neutrophils 435
 collagenases 454
 elastase in 453
 integrins and inflammation 444, 451
 role in asthma 478
 role in emphysema 462
 role in fibrotic lung disease 468
 role in sarcoidosis 475
 Nicotinic cholinergic receptors, airways 362
 NIH3T3 cells, oncogenes 260
 Non-adrenergic inhibitory nerves, airways 381
 Non-cholinergic excitatory nerves, airways 386
 Noradrenaline, effect on cholinergic transmission in airways 361
 Nutrition, porphyria 63
- Oestrogens, 5-aminolevulinic acid synthase induction 121
 Oncogenes, metastasis 259
 Oxidant-generating systems, leucocytes 452
 Oxygen free radicals, asbestos stimulated production 340
- Parasympathetic airway ganglia 364
 Peptide histidine isoleucine, in airways 385
 Phagocytes 432, 435
 1,10-Phenanthroline, uroporphobilinogen synthase inhibition 27
 Phlebotomy 73
 Phospholipid bilayer, red cell membrane 165
 Phosphorylation, red cell membrane proteins 173
 Photochemotherapy 99-111
 Photofrin II 101, 102
 Photosensitivity 7, 11, 100, 104
 Alagille syndrome 77
 animal model 105
 effect of oral activated charcoal 62
 porphyrins 109
 purpurin and metalloporphyrin derivatives 107
- Phototherapy, porphyrins 17
 Platelet-activating factor
 asthma 477
 leucocytes 455
 Platelet-derived growth factor 458
 Platelets 439
 role in asthma 480
 Poikilocytosis 186, 193
 Poland, porphyria in 43
 Polymorphonuclear leucocytes 432
 Polyploidy, mineral fibre induced 340
 Porphobilinogen 7, 8, 14
 Porphobilinogenase, in spleen in congenital erythropoietic porphyria 87
 Porphobilinogen deaminase
 active site of 142
 dipyrrromethane cofactor 143
 ELISA 32
 in erythrocytes, errors in measurement 33
 in erythrocytes, Finland 44
 independent and sequential functioning 30
 inhibition by haem precursors 51
 effect of sex hormones 52
 sulphamerazine inhibition of 144
 Porphobilinogen deaminase gene 125, 126
 Porphobilinogen synthase, ¹³C NMR 142
 Porphyria
 epidemiology 39-48
 history 3
 pathogenesis 49-57
 phases of 44
 therapy 59-66, 67-82
 Porphyria cutanea tarda 67-82
 desferoxamine 72
 epidemiology 39-48
 familial versus sporadic 71, 81
 haemodialysis associated 73
 HLA types 76
 hexachlorobenzene 78, 81
 inheritance and prevalence 75
 iron 67, 72, 74, 76, 82
 mitochondrial function 80
 serum ferritin 80
 serum porphyrin 78, 157
 trace elements 76
 urinary porphyrin 157
 UV-A radiation 80
 zinc 79
 Porphyria variegata 11, 12
 Porphyrinogen, in bile 54
 Porphyrinogenicity of drugs 113-123
 Porphyrins
 in bile 54
 biochemistry 21-37
 cancer, photochemotherapy 17, 99-111
 chemistry 17
 early synthesis 13
 evaluation of analytical methods 36
 GCMS 19
 Harderian gland 145-152
 HPLC 33, 35
 plant and bacterial systems 131-135
 radiolabelled 110

- synthesis in cultured cells 139
 - synthesis in liver, drug-related 12
 - synthesis, recent progress 19
 - tumour phototherapy 17, 99-111
- Porphyrin synthesis genes, cloning and expression in *E. coli* 129
- Potassium octatitanate 340
- Prazosin, inhibition of effects of haem biosynthetic intermediates 53
- Pregnancy
 - porphobilinogen deaminase in red blood cells 52
 - porphyrin synthesis in Harderian gland 151
- Propentdyoents and the Stokvis reaction 18
- Propofol 119
- Propranolol, bronchoconstriction 371
- Protein 4.1, red cell membranes 172, 174, 175, 176, 181
 - elliptocytosis 197
 - sialoglycoprotein interaction 199
 - variants 199
- Protein 4.9, red cell membranes 172
- α -1-Proteinase inhibitor, emphysema 460, 463
- Proteoglycans, lung 430
- Protoporphyrin
 - ferochelatase in cattle 88
 - griseofulvin induced 123
- Protoporphyrin
 - in erythrocytes, effect of valproic acid 117
 - in liver 85
 - photodynamic transfer from erythrocytes to cells in culture 88
 - photosensitization by 109
- Protoporphyrin IX
 - measurement 34
 - effect of prazosin on pharmacological activity 53
 - in workers exposed to lead 31
- Protoporphyrinogen oxidase 24
- Protoporphyrinogen IX oxide 45
- Pulmonary fibrosis, asbestos induced 333, 335, 465
- Pulmonary innervation 354
- Purpurin 107, 132
- Pyropoikilocytosis 190, 193
- Rapidly adapting receptors, airways 357
- Rat embryo fibroblasts, *H-ras* oncogene 264
- Red cell skeleton, genetic disorders 161-241
 - acanthocytosis 211
 - anion transporter protein 177
 - composition 167
 - congenital dyserythropoietic anaemias 213
 - haemoglobinopathies 215
 - hereditary elliptocytosis 185
 - hereditary spherocytosis 203
 - protein 4.1 172
 - sialoglycoproteins 179
 - spectrin α - and β -chains 168
 - stomatocytosis 209
- Respiratory tract
 - inhalation and retention of mineral fibres 331
 - innervation 353
 - leucocytes and disorders of 425-526
- Restriction fragment length polymorphism, acute intermittent porphyria 127, 128, 130
- Rhesus proteins, stomatocytosis 210
- Rhizobium japonicum*, 5-aminolevulinic acid dehydratase in 135
- Ribonucleic acid expression, metastasis 275
- mRibonucleic acids, 5-aminolevulinic acid synthase and cytochrome P-450 117, 120
- Rimington, C. 3
- Saccharomyces cerevisiae*, porphobilinogen synthase purification 129
- Sarcoidosis, role of leucocytes 471
- Sex hormones, porphyria 52, 59
- Sialoglycoproteins, red cell membranes 179
 - elliptocytosis 198
 - variants 212
- Sickle cell disease 215
- Siderblastic anaemias, 5-aminolevulinic acid synthase 96
- Silicates 327
- Silicosis 336
- Slowly adapting receptors, airways 357
- Somatic cell hybridization 256
- Somatomedin C 458
- South Africa, porphyria 43
- Spain, porphyria 48
- Spectrin, red cell membranes 168, 174, 176, 181
 - ankyrin-band 3 articulation defects 195
 - elliptocytosis 188
 - shortened β -chain variants 194
 - spherocytosis 205
- Spectrin α - and β - genes, red cell membrane 170
- Spherocytosis 203
- Spinal cord, effect of 5-aminolevulinic acid 53
- Spironolactone, induction of hepatic porphyria 116
- Spleen, porphobilinogenase in 87
- Stanton fibres 337, 338
- Stokvis, B.J. 6
- Stokvis reaction 18
- Stomatocytosis 209
- Streptozotocin diabetic mice, haem biosynthesis in 28, 29
- Stretch receptors 357
- Substance P, in airways 358, 386
- Succinylacetone 118
- Sulphamerazine, inhibition of porphobilinogen deaminase 144
- Sulphaemals 19
- Superoxide, uroporphyrinogen oxidation 74

- Swedish Porphyric Association 64
 Sympathetic innervation, airways 369
- Tachykinins, in airways 387
 Talc 339
 β -Thalassaemia 202, 216
 haem biosynthesis, iron utilization 94
 Tin-protoporphyrin 23
 effect on haem oxygenase 36
 porphyrin therapy 61
 T lymphocytes 439
 Tobacco smoke, asbestos interaction 341
 Trace elements, cutaneous porphyrias 76
 Transferrin, binding in hepatocytes 30
 Transforming growth factor β 458
 Transmembrane proteins, red cells 177
 Tropomyosin 173
 Tumour cells, metastasis 245
 Tumour heterogeneity 247
 Tumour necrosis factor, in leucocytes 456
 Tumour suppressor genes 256
 Turkish porphyria 11, 13
- Uridine diphosphate glucuronyl
 transferase 153
 genetic deficiency 156
 Uroporphyrin, role of iron 122
 Uroporphyrin
 detection in malignant cells 110
 photosensitization by 109
 Uroporphyrinogens 8
 oxidation by methylcholanthrene-induced
 cytochrome P-450 115
 Uroporphyrinogen III cosynthase 30
 Uroporphyrinogen decarboxylase
 in erythroleukemia cells, effect of dimethyl
 sulphoxide 97
- porphyria cutanea tarda 72, 74, 76, 77, 79
 UV-A irradiation, porphyria cutanea
 tarda 80
- Vagus nerve, bronchoconstriction 359
 Valproic acid, effect on haem
 biosynthesis 117
 biosynthesis 117
 Variegate porphyria 11, 12, 22
 bile porphyrin and porphyrinogen levels 54
 charcoal administration 62
 epidemiology 39-48
 haem arginate therapy 61
 inhibition of porphobilinogen deaminase by
 haem precursors 51
 protoporphyrinogen IX oxide in
 lymphocytes 45
 Vasoactive intestinal peptide, in airways 382
 Very late antigen integrins 445
 Vinblastine, effect on porphyrin
 synthesis 120
 Vincristine, effect on porphyrin synthesis 120
 Vitronectin receptor 445
- Xerocytosis 209
 X-porphyrins 9
- Yugoslavia, porphyrias in 46
- Zeolites 328
 Zinc, in serum and urine of porphyria
 patients 79
 Zinc deuteroporphyrin IX,2,4, bis glycol,
 haem oxygenase inhibition 160
 Zinc protoporphyrin 26